NDEE Technical Review Comments
AltEn Facility Response Group -- Proposed Approach for Management of Water from AltEn Site
Facility ID: 84069, PCS/RAP

Introduction

The Department has reviewed the AltEn Facility Response Group's (the Group) proposal and offers the below comments. The Department believes this plan, once the Department's comments are addressed, will be protective of human health and both short-term and long-term groundwater contamination and will be protective of waters of the State. For the Group to land apply treated wastewater from the AltEn facility, they must utilize the existing AltEn NPDES permit NE0137634, which allows land application of treated wastewater. Requirements for land application are in Part II of the permit. The land applier (e.g. the Group) must submit a land application Best Management Practices (BMP) plan to the Department for approval prior to land application. The BMP for land application of treated wastewater shall be prepared in consultation with a professional agronomist or certified crop specialist. The requirement to include a specialist is to ensure the protection of groundwater, surface water, and to prevent long-term negative impacts to the receiving land application soil. The Group must also receive approval for each land application site. Each land application site must have the nutrient rate calculations provided to the Department prior to site approval to ensure that the agronomic rate is met.

1. In the section entitled "Background on Pesticides Found at AltEn's Site", the following statement exists:

   > "In our assessment, we have reviewed AltEn shipment records provided by NDEE and the associated seed treatments used on seed corn by member companies in the relevant time period and have identified the following active ingredients (Table 1) as the focus for the assessment."

   The Department does not have shipment records and associated seed treatments used on seed corn at AltEn. Please remove this statement.

2. Please provide a more detailed justification for the selection of the list of thirteen analytes, also referred to as the focused analyte panel.

3. As described in Comment No. 1, the Department does not have records for the seed treatments used on seed corn and other materials received by the AltEn facility. It is the Department's understanding that the facility accepted many different types of products for use at their facility, including treated wheat seed and treated soybean seed. Thus, comprehensive analysis of the raw wastewater is required to provide justification for a reduced treated water/land application analyte list.

   Please provide raw wastewater data for the three industrial wastewater lagoons, as well as the emergency lagoon. This should include data from at least one composite sample from each lagoon. The sampling requirements are described in more detail in Appendix A. If a different sampling method is desired, please submit that plan to the Department for review and approval prior to sampling.

   The required analyte list for the samples is included in Appendix B. This is the same analyte list that was included in the letter sent to AltEn on April 9, 2021. The Department is aware that there may not be a known commercial laboratory available that is able to provide analysis for ethaboxam, penflufen, and tolclofos-methyl. If this is the case, these analytes do not need to be included in the analysis. The lagoon samples should be sent to both Pacific Agricultural

Laboratory (PAC) and South Dakota Agricultural Laboratory (SDAL) for analysis. All pesticides that can be analyzed at both laboratories should be analyzed at both for comparison (split sample).

4. Please provide more information to ensure that the pesticide data accounts for total pesticide concentration (the sum of dissolved pesticide and pesticide sorbed to suspended solids). In the Department's preliminary research, it appears that the two laboratories utilized in the past have different processes that may or may not account for pesticides present in the solids.

5. Please add sodium adsorption ratio (SAR) and total dissolved solids (TDS) to the analytical suite for non-pesticide components in treated water.

6. Please verify the proposed thresholds for single application for the analytes listed in Table 1. Some of the thresholds do not appear to be based on the given EPA-approved application rates for field corn that represent 10% of foliar rates or 20% of seed treatment rates, if no foliar rate for field corn is established for the active ingredient. Here are the discrepancies:

    a. Chlorantraniliprole: The proposed threshold for single application (113.4 g/acre) appears to be an error as it exceeds the maximum annual application value provided of 90.8 g/acre.

    b. Imidacloprid: Imidacloprid is one of the pesticides in Table 1 that does not have a foliar rate for field corn, but a foliar rate does exist for other crops. Of these compounds, it is the only one that has a higher single application rate for seed treatments than for foliar applications. Thus, for this pesticide, it would be more conservative to use 10% of the maximum single foliar application rate of 21.2 g/acre than 20% of the seed application rate of 33.5 g/acre, particularly given the toxicity of imidacloprid to pollinators and the additional risks that may occur from foliar applications of this pesticide verses seed treatment applications.

    c. Clothianidin: The proposed threshold for single application (3.0 g/acre) is 24% of the seed treatment rate of 12.5 g/acre. Please explain this discrepancy from the 20% of seed treatment rate described in the proposal.

    d. Please provide more information regarding how the proposed thresholds for metalaxyl/mefenoxam were determined.

    e. Please provide more information regarding how the proposed thresholds for thiabendazole were determined.

7. For the pesticides that do not have registered foliar uses for field corn, but do have registered foliar uses for other crops, please provide justification for the foliar application of these pesticides to field corn. This should include an explanation as to why this is acceptable and assurance that there will not be adverse impacts to human health or the environment.

8. For the pesticides that do not have registered foliar uses for field corn, but do have registered foliar uses for other crops, please provide (in Table 1) which crop the maximum single and annual application rates apply to.

9. Based on Table 1., it appears there are no approved foliar uses for any crops for sedaxane or thiabendazole. Please provide justification for any non-seed treatment use (i.e. chemigation) of these pesticides. This should include an explanation as to why this is acceptable and assurance that there will not be adverse impacts to human health or the environment.

10. The proposal states that the single irrigation application thresholds will be based on U.S. EPA-approved application rates for corn that represent 10% of foliar rates and 20% of seed treatment rates, if no foliar rate for corn is established for the active ingredient. Please provide more information regarding how these values were determined.

11. The proposal requires that a combined total of a family grouping (mode of action) will not exceed 200% of the cumulative thresholds. Please provide more information regarding how this value was determined.

12. Please clearly specify how the analytes were grouped into families or modes of action to consider cumulative environmental impacts.

13. The proposal states, "Thresholds for degradates or metabolites for a pesticide identified as potentially presenting increased risk are included in the analytical suite and do not exceed the threshold for the pesticide from which it was derived." Please include more information about this statement. Please identify the metabolites/degradates that are included in the analytical suite.

14. The proposal includes three options if levels of pesticide analytes are higher than the proposed thresholds in treated water listed in Table 1. The Department does not agree with Options 2 and 3. Once the proposed thresholds are agreed upon and accepted by the Department, the Department does not anticipate approving higher thresholds. Please remove these options from the proposed plan.

15. Of the three primary categories of "land suitable for irrigation", please note that the Department has concerns with land applying treated wastewater containing pesticides on non-cultivated land in permanent cover. Please add additional precautions to the proposal for land application on non-cultivated land and include if the pesticides in Table 1 have foliar rates or chemigation rates for non-cultivated land. These precautions could include lower foliar percent rates and lower cumulative rates. The Department also requests the proposal to provide more certainty; for example, rather than describe the evaluation or consideration provide specific precautions and thresholds that would be employed. Lastly, if there is uncertainty of land applying treated wastewater to non-cultivated land because it has not been fully assessed this could be removed from the proposal and evaluated later.

16. The proposal is heavily focused on efforts to ensure protection to the agronomic uses of the land with less emphasis on ensuring that land application of multiple pesticide active ingredients will not adversely impact ecological receptors or human health. See below for examples. Please revise the proposal to ensure that ecological receptors and human health will also be protected.

    i. Executive Summary: "*Application of the treated water would be intended to have no consequences for the agricultural crop other than as a source of water and nutrients and would allow harvest and utilization of the crop as would normally occur.*"
    ii. Crop Production: "*Treated water from the AltEn site will be applied only to fields that have been assessed to ensure the active ingredient residues detected will not impact existing crops/vegetation cover or existing biodiversity (non-cultivated areas).*"
    iii. Summary: "*The proposed plan would create minimal disruption in normal agricultural practices and have negligible impact on crops produced from the land where treated water is applied. The proposed application of treated water is not expected to cause changes in the plant-soil health characteristics or degrade the long-term use of the application area.*"

17. Item 1. of the "proposed requirements for target application fields to receive treated water" states, "Tests shall be completed for each contained storage unit of treated water (~3,000,000 gallons) and based on representative samples obtained during the filling of temporary water storage tanks." The Department requests a composite batch sampling, evaluation, and discharge approach for each storage tank. This will better account for variations in treatment efficacy and raw water quality. Please update the proposal to include a description of the tank sampling method that meets these requirements. If a different sampling approach is requested, it will require a sampling plan for review and approval by the Department.

18. The proposal states that filtration units have been "highly effective in removing pesticides". Data should be provided in a table or appendix to support this statement.

19. Item 3.c. of the "proposed requirements for target application fields to receive treated water" states, "Applications of fungicides or insecticides will be documented during the crop production cycle and reported to ensure these are factored into overall pesticide load within the field during the growing season." The second category of "land suitable for irrigation" included in the proposal (agricultural land in post-harvest status from annual crop production) states, "There would be no preferred crop for planned planting, as any pesticide residue proposed in the treated water would be at levels consistent with those typical in conventional annual crop agricultural systems and would present no consequences **for a planted crop**." Maximum annual application rates should not be exceeded regardless of the presence or absence of a crop. Please explain how it will be ensured that maximum annual application rates are not exceeded outside of the growing season (i.e. if treated water is applied to agricultural land in post-harvest status).

20. Please provide more information about soil sampling. For example, include how the composite sample will be collected and how many samples will be collected per field.

21. For the pesticides with labeled foliar uses, please indicate in Table 1 whether the labeled use places any restrictions on the timing of use. For the pesticides without a registered foliar use on field corn, please indicate how timing of the chemigation events was evaluated.

22. Please add a description of potential site restrictions, when those restrictions would be necessary, and the duration of the restrictions, post application of wastewater.

23. Items 3.h. and 5.f. of the "proposed requirements for target application fields to receive treated water" discusses pesticide residues in soil. Please provide explicit values for the thresholds in soil that would be used to determine if harvested grain would be sampled, and explicit harvested grain thresholds that would trigger destruction of the grain.

24. Item 5.a. of the "proposed requirements for target applications to receive treated water" states, "In no instance shall slopes exceed 12 degrees." Please revise this to not exceed 9 degrees.

25. Item 5.b. describes fields that have tile drains and that the application rates must not exceed the soil water holding capacity. The Departments requests that land application of wastewater to tile drained fields be restricted to the growing season.

26. Although this does not need to be added to the proposal, please ensure that the nutrient management plan and Best Management Practices (BMP) plan are in accordance with any additional requirements that may exist for the applicable local Natural Resources District (NRD).

Appendix A

Raw Water Sampling Requirements

A composite sample should be collected from each of the three lagoons in the three-celled industrial lagoon system, as well as the emergency lagoon. This composite sample should include samples from eight locations from each lagoon, including the four corners of the lagoon and the middle of each side of the lagoon. Moreover, at each sampling location, three discrete samples should be collected at different depths to form a depth-based composite sample at that location. This will result in 24 discrete samples from each lagoon that will result in a single composite sample for each lagoon. All discrete samples should be of equal volume.

The three different depths where three discrete samples should be collected at each sampling location are as follows:

1. One discrete sample 18 inches above the bottom of the lagoon
2. One discrete sample 18 inches below the water surface, and
3. One discrete sample equidistant from these two samples.

For example, if the total depth of the lagoon at the time of sample collection is 12 feet, one sample would be collected 1.5 feet from the bottom, one sample would be collected 6 feet from the bottom, and one sample would be collected 10.5 feet from the bottom. If sludge accumulation has occurred, the deepest sample will occur 18 inches above the top of the sludge accumulation. For example, if the total lagoon depth is 14 feet, but 6 feet of the depth is sludge, then a sample will be collected 1.5 feet above the sludge (7.5 feet from original bottom), 4 feet above the sludge (10 feet from original bottom), and 6.5 feet above the sludge (12.5 feet from original bottom).

If the depth between the bottom of the lagoon or top of the sludge to the water surface is less than five feet, only two discrete samples need to be collected at the sampling location. In this case, one discrete sample should be taken 18 inches above the bottom of the lagoon and one discrete sample should be taken 18 inches below the water surface. If the water depth is less than three feet, only one discrete sample needs to be taken and it should be collected from a point equidistant from the bottom of the lagoon or top of the sludge and the water surface. The total depth of each lagoon and the sludge depth will be recorded for each lagoon at the time of sampling.

An equipment rinsate blank sample should be collected for all non-disposable equipment.

Appendix B

Table 1. Pesticide Analyte Requirements

Chemical	PAC or SDAL?
Abamectin	Both
Acetamiprid	Both
Azoxystrobin	Both
Bifenthrin	Both
Brassinazole	Both
Captan	PAC
Carbendazim (Thiophanate-methyl degradate)	PAC
Carboxin	PAC
Chlorantraniliprole	Both
Chloropyrifos (Chloropyrifos-ethyl)	PAC
Chloropyrifos-methyl	PAC
Clothianidin	Both
Cyfluthrin 1-4	Both
Cyantraniliprole	PAC
Cyhalothrin 1-2	Both
Cypermethrin 1-4	Both
Cyproconazole	Both
Deltamethrin 1-2	Both
Desthio-prothioconazole	SDAL
Difenoconazole	Both
Dimoxystrobin	Both
Dinotefuran	Both
Epoxiconazole	Both
Ethaboxam	Unknown – may not be offered by commercial lab
Fluconazole	Both
Fluoxastrobin	Both
Fludioxonil	Both
Glufosinate	Both
Glyphosate	Both
Imidacloprid	Both
Ipconazole	Both
Isavuconazole	Both
Itraconazole	Both
Mancozeb	PAC
Metalaxyl/Metalaxyl-M (Mefenoxam)	PAC
Metconazole	Both
Nitenpyram	Both
Orysastrobin	Both
Penflufen	Unknown – may not be offered by commercial lab
Permethrin 1-2	Both
Picoxystrobin	Both
Posaconazole	Both

Propiconazole	Both
Prothioconazole	Both
Pyraclostrobin	Both
Ravuconazole	Both
Sedaxane	SDAL
Sulfonic acid prothioconazole	SDAL
Tebuconazole	Both
Tetraconazole	Both
Thiabendazole	Both
Thiacloprid	Both
Thiamethoxam	Both
Thiram	PAC
Thiophanate-methyl	Both
Tolclofos-methyl	Unknown – may not be offered by commercial lab
Trifloxystrobin	Both
Uniconazole	Both
Voriconazole	Both